Xantrex™ GT250 E 250 kW Grid-Tied Photovoltaic Inverter

Planning and Installation Manual

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About This Manual

Purpose

The purpose of this Planning and Installation Manual is to provide explanations and procedures for planning and installing the Schneider Electric Xantrex GT250 E 250 kW Grid-Tied Photovoltaic Inverter.

Scope

The Manual provides safety guidelines, detailed planning and setup information, and procedures for installing the inverter.

Audience

The Manual is intended for use by anyone who plans to construct or install a system involving the Xantrex GT250 E 250 kW Grid-Tied Photovoltaic Inverter. Installers must meet all local and state code requirements for licensing and training for the installation of Electrical Power Systems with AC and DC voltage to 1000 volts.

Organization

This Manual is organized into four chapters:

Chapter 1, “Introduction” provides information about the features and functions of the Xantrex GT250 E 250 kW Grid-Tied Photovoltaic Inverter.

Chapter 2, “Planning” provides information to help plan the installation of the Xantrex GT250 E 250 kW Grid-Tied Photovoltaic Inverter.

Chapter 3, “Installation” describes the procedures needed to install the Xantrex GT250 E 250 kW Grid-Tied Photovoltaic Inverter. This section includes unpacking and moving instructions, mounting instructions, and cabling instructions.

Chapter 4, “Verification” provides a checklist to ensure the installation of the Xantrex GT250 E is correct and complete.

Conventions Used

The following conventions are used in this guide.

WARNING

Warnings identify conditions or practices that could result in personal injury or loss of life.

CAUTION

Cautions identify conditions or practices that could result in damage to the unit or other equipment.

Important: These notes describe things which are important for you to know, but not as serious as a caution or warning.

Abbreviations and Acronyms

ANSI	American National Standards Institute
CCU2	Converter Control Unit 2
CFM	Cubic Feet per Minute
CW	Clockwise
DSP	Digital Signal Processor
FPGA	Field Programmable Gate Array
GUI	Graphical User Interface
IEEE	Institute of Electrical and Electronics Engineers
IGBT	Insulated Gate Bipolar Transistor
IPM	Intelligent Power Module
kcmil	1000 circular mils
LCD	Liquid Crystal Display
NFPA	National Fire Protection Association
PBX	Private Branch Exchange
PSL	Phase-Shift Loop
PV	Photovoltaic
UFCU	Universal Frontpanel Control Unit

Related Information

You can find more information about Schneider Electric as well as its products and services at www.schneider-electric.com.

Important Safety Instructions

SAVE THESE INSTRUCTIONS - DO NOT DISCARD

This manual contains important safety instructions for the Xantrex GT250 E 250 kW Grid-Tied Photovoltaic Inverter (Xantrex GT250 E) that shall be followed during installation and maintenance procedures.

WARNING: Shock Hazard

Read and keep this Planning and Installation Manual for future reference. Before installing Xantrex GT250 E read all instructions, cautionary markings, and all other appropriate sections of this manual. Failure to adhere to these warnings could result in severe shock or possible death. Exercise extreme caution at all times to prevent accidents.

WARNING: Shock Hazard

The Xantrex GT250 E Enclosures contain exposed high-voltage conductors. The Enclosure doors should remain closed with the latches tightened, except during installation, maintenance or testing. These servicing instructions are for use by qualified personnel who meet all code requirements for licensing and training for the installation of Electrical Power Systems with AC and DC voltage to 1000 volts. To reduce the risk of electric shock, do not perform any servicing other than that specified in the installation instructions unless you are qualified to do so. Do not open the cabinet doors if extreme moisture is present (rain or heavy dew).

WARNING: Lethal Voltage

In order to remove all sources of voltage from the Xantrex GT250 E, the incoming power must be de-energized at the source. This may be done at the main utility circuit breaker and by opening the AC Disconnect and the DC Disconnect Switches on the Xantrex GT250 E. Review the system configuration to determine all of the possible sources of energy. In addition, allow 20 minutes for the DC bus capacitors, located within the cabinet, to discharge after removing power.

Risks

WARNING: Shock hazard

Parts of the condenser charge will still be energized for a maximum of 20 minutes after being disconnected.
Open device cover plates or doors only after the device is disconnected and discharged. Check whether the device is no longer live (DC voltage) including terminals PV+ and PV-.

WARNING: Explosion hazard

The IGBT module may explode in the event of a major malfunction.
Do not operate larger devices while the pivoting part is opened.

WARNING: Crush hazard

The inverters have a very high balance point and can easily topple down. Only move while exercising care. Pay attention to the balance point sticker during transport.

WARNING: Amputation hazard

The inverters contain integrated ventilators including rotating ventilator wheels. Do not place fingers in ventilator.

WARNING: Burn hazard

Inverters contain components that become hot during normal operation. Do not touch.

CAUTION

The inverters have a supply air and exhaust air area, which must remain unobstructed. The device can overheat and be destroyed if the installation signs are not adhered to.
Disassemble the tracks required for transportation located at the top for operating the cabinet devices.

CAUTION

Inverter electronics can be destroyed when touched and when electrostatically charged. Discharge via earth potential before touching and wear appropriate protective gear.

CAUTION

No connections or disconnections are allowed at the terminal strips or internal connectors during operation.

Turn device off before performing terminal work; wait 5 to 20 minutes (condenser charge) and recheck to ensure device is no longer live.

General Safety Precautions

1. When installing the Xantrex GT250 E use only components recommended or sold by the manufacturer. Doing otherwise may result in a risk of fire, electric shock, injury to persons, and will void the warranty.
2. Do not attempt to operate the Xantrex GT250 E if it has been dropped, or received more than cosmetic damage during transport or shipping. If the Xantrex GT250 E is damaged, or suspected to be damaged, see the Warranty for this unit in the Xantrex GT250 E Operation and Maintenance Manual.
3. To reduce the risk of electrical shock, lock-out and tag the Xantrex GT250 E before attempting any maintenance, service, or cleaning.

Personal Safety

Follow these instructions to ensure your safety while working with the Xantrex GT250 E.

Qualified Personnel

Only qualified personnel should perform the transportation, installation and initial operation and maintenance of the Xantrex GT250 E (IEC 364 or CENELEC HD 384 or DIN VDE 0100 and IEC 664 or DIN VDE 0110). Follow all national accident prevention regulations.

Qualified personnel, within the meaning of these basic safety regulations, will be people who are familiar with the installation, assembly, start-up and operation of the Xantrex GT250 E and have the appropriate qualifications with respect to their functions.

Safety Equipment

Authorized service personnel must be equipped with standard safety equipment including the following:

- Safety glasses
- Ear protection
- Steel-toed safety boots
- Safety hard hats
- Padlocks and tags
- Appropriate meter to verify that the circuits are de-energized (1000 Vac and DC rated, minimum)

Check local safety regulations for other requirements.

Wiring Requirements

1. All wiring methods and materials shall be in accordance with the National Electrical Code ANSI/NFPA 70, European Requirements, as well as all state and local code requirements (for example, DIN / VDE).
2. The Xantrex GT250 E has a three-phase output.
3. The AC power conductor wiring interfacing with the AC terminals in the AC Interface Enclosure (-H0) are located at L1, L2, L3. These terminals requires the use of a crimp-on type ring terminal or compression-type lug. Keep these cables together as much as possible and ensure that all cables pass through the same knockout and conduit fittings, allowing any inductive currents to cancel. For torque values, see Table A-5 on page A–5. See Figure 3-8 on page 3–9 for the location of these terminals.
4. The AC neutral conductor from the transformer is terminated in the AC Interface Enclosure (-H0) at the Copper Ground Bar. This terminal requires the use of a crimp-on type ring terminal or compression-type lug. For torque values, see Table A-5 on page A–5. See Figure 3-8 on page 3–9 for the location of these terminals.
5. The AC Control Voltage wiring interfacing with the Control Voltage terminals in the AC Interface Enclosure are located at -X2 L1, L2 and PE. For torque values, see Table A-5 on page A–5. See Figure 3-8 on page 3–9 for the location of these terminals.
6. The DC power conductor wiring interfacing with the DC terminals is terminated in the DC Interface Enclosure (-H2). These terminals requires the use of a crimp-on type ring terminal or compression-type lug. Keep these cables together as much as possible and ensure that all cables pass through the same knockout and conduit fittings, allowing any inductive currents to cancel. For torque values, see Table A-6 on page A–5. See Figure 3-9 on page 3–11 for the location of these terminals.
7. This product is intended to be installed as part of a permanently grounded electrical system as per the National Electric Code ANSI/NFPA70 and EU requirements, as well as all state and local code requirements (for example, DIN/VDE). A copper ground rod must be installed within 3 ft. (1 m) of the Xantrex GT250 E Enclosure. This is the single point earth ground for the inverter system. The single point ground for the system is to be made at the ground bus bar in the AC Interface Enclosure.
8. The equipment grounds on the Xantrex GT250 E are marked with PE.
9. AC overcurrent protection for the utility interconnect (Grid-tie) must be provided by the installers as part of the Xantrex GT250 E installation.

CAUTION: Fire Hazard

In accordance with the National Electrical Code, ANSI/NFPA 70, connect only to a circuit

provided with 1200 amperes maximum branch circuit overcurrent protection.

Operational Safety Procedures

Never work alone when servicing this equipment. A team of two is required until the equipment is properly de-energized, locked-out and tagged, and verified de-energized with a meter.

Thoroughly inspect the equipment prior to energizing. Verify that no tools or equipment have inadvertently been left behind.

Lockout and Tag

Safety requirements mandate that this equipment not be serviced while energized. Power sources for the Xantrex GT250 E must be locked-out and tagged prior to servicing. A padlock and tag should be installed on each energy source prior to servicing.

WARNING: Shock Hazard

Review the system schematic for the installation to verify that all available energy sources are de-energized. DC bus voltage may also be present. Be sure to wait the full 20 minutes to allow the capacitors to discharge completely. Schematics are located inside the front door of the unit.

The Xantrex GT250 E can be energized from both the AC source and the DC source. To ensure that the inverter is de-energized prior to servicing, lockout and tag the Xantrex GT250 E using the following procedure.

1. Open, lockout, and tag the incoming power at the utility main circuit breaker.
2. Open, lockout, and tag the AC Disconnect Switch (-Q1) on the AC Interface Enclosure (-H0). See Figure 1-4 on page 1–6 for the location of the AC Disconnect Switch.
3. Open, lockout, and tag the DC Disconnect Switch (-Q11) on the DC Interface Enclosure (-H2). See Figure 1-4 on page 1–6 for the location of the DC Disconnect Switch.
4. Using a confirmed, accurate meter, verify all power to the inverter is de-energized. A confirmed, accurate meter must be verified on a known voltage before use. Ensure that all incoming energy sources are de-energized by checking the following locations.
   a) AC Utility Terminals: (Bottom of L1, L2, L3 and PE)
   See Figure 3-9 on page 3–11 and Figure 3-10 on page 3–11 for the location of these terminals.
   b) PV Terminals: (PV+ and PV-)
   See Figure 3-11 on page 3–12 for the location of these terminals.

De-Energize/Isolation Procedure

The following procedure should be followed to de-energize the Xantrex GT250 E for maintenance.

WARNING

The terminals of the DC input may be energized if the PV arrays are energized. In addition, allow 20 minutes for all capacitors within the main Enclosure to discharge after disconnecting the Xantrex GT250 E from AC and DC sources.

To isolate the Xantrex GT250 E:

1. Turn the ON/OFF switch to the OFF position.
2. Open the DC interface disconnect switch (-Q11).
3. Open the AC interface disconnect switch (-Q1).
4. Open the utility connection circuit breaker.
5. Install lockout devices on the utility connection circuit breaker, AC and DC disconnect switch.

Interconnection Standards Compliance

The Xantrex GT250 E complies with the German grid protection requirements of VDEW and the Spanish RD 1663/2000.

The Xantrex GT250 E is designed to meet *UL 1741 Static Inverters And Charge Controllers For Use In Photovoltaic Power Systems*, as well as *IEEE 519*.

Refer to both documents for details of these recommendations and test procedures.

Intended Use

The Xantrex GT250 E may only be used in connection with PV modules. It is not suitable for any other application areas.

An initial operation (e.g. starting the intended operation) will only be allowed when observing the EMC guideline (89/336/EWG).

The Xantrex GT250 E complies with the 73/23/EWG low voltage directive requirements. The harmonized standards of the series EN 50178/DIN VDE 0160 in connection with EN 60439-1/DIN VDE 0660 part 500 and EN 60146/DIN VDE 0558 will be used for the inverters.

Contents

Important Safety Instructions - v

1 Introduction

Description of the Xantrex GT250 E - - - - - - - - - - - - - - - - - - -

Remote Communications ---------- 3–13
Telephone Line Connections ---------- 3–13
PC Connection Methods ---------- 3–14
Remote Connection (Standard) ---------- 3–14
Direct Connection (Serial) ---------- 3–14

4 Verification

Verification Procedure Summary ---------- 4–2
Visual Inspection of Mechanical Connections ---------- 4–3
Visual Inspection of Electrical Connections ---------- 4–3
Corrective Action ---------- 4–3

A Specifications

System Specifications ---------- A–2
Environmental Specifications ---------- A–2
Electrical Specifications ---------- A–3
Regulatory Specifications ---------- A–3
Over Voltage, Under Voltage and Frequency Ranges ---------- A–4
Bolt Sizing and Torque Requirements ---------- A–5
Dimensions ---------- A–6

Figures

Figure 1-1 Xantrex GT250 E Operator Interface Components - 1–3
Figure 1-2 ON/OFF Switch - 1–4
Figure 1-3 Emergency Stop - 1–5
Figure 1-4 AC and DC Disconnect Switches - 1–6
Figure 1-5 LCD Display and UFCU Location - 1–8
Figure 1-6 MultiTech® 56K Modem and RS232/FO Converter - 1–10
Figure 1-7 Surge Arrester - 1–10
Figure 1-8 RS232/FO Converter Kit - 1–11
Figure 2-1 Xantrex GT250 E Electrical Diagram - 2–5
Figure 2-2 Enclosure Conduit Entries, Bottom Side View - 2–5
Figure 2-3 Main Inverter Anchor Bolt Pattern (Not to scale) - 2–6
Figure 3-1 Center of Gravity - 3–3
Figure 3-2 Forklift Lifting Locations - Underneath Unit - 3–4
Figure 3-3 Lifting Using a Crane - 3–4
Figure 3-4 Inverter Enclosure Access Doors - 3–5
Figure 3-5 AC Interface Access Door - 3–6
Figure 3-6 DC Interface Access Door - 3–6
Figure 3-7 Single-point Ground; Ground Bar - 3–9
Figure 3-8 Chassis Ground Bar (TB1) - 3–9
Figure 3-9 AC Terminal Connections from the Utility - 3–11
Figure 3-10 AC Control Voltage Terminal Connections - 3–11
Figure 3-11 PV Array Cable Routing and Terminations - 3–12
Figure 3-12 Telephone Cable Routing - 3–13
Figure 3-13 RS232/FO Converter Kit Installation - 3–15
Figure A-1 Xantrex GT250 E Dimensions - A–6

Tables

Table A-1 Environmental Specifications - - -

1 Introduction

Chapter 1, “Introduction” provides information about the features and functions of the Xantrex GT250 E 250 kW Grid-Tied Photovoltaic Inverter.

This manual is for use by qualified personnel only.

Description of the Xantrex GT250 E

The Xantrex GT250 E 250 kW Grid-Tied Photovoltaic Inverter is a utility interactive, three-phase power conversion system for grid-connected photovoltaic arrays with a power rating of 250 kW. Designed to be easy to install and operate, the Xantrex GT250 E automates start-up, shutdown, and fault detection scenarios. With user-definable power tracking that matches the inverter to the array and adjustable delay periods, users are able to customize start up and shut down sequences. Multiple Xantrex GT250 E inverters are easily paralleled for larger power installations.

The Xantrex GT250 E power conversion system consists of a pulse-width modulated (PWM) inverter, switch gear for isolation and protection of the connected AC and DC power sources. Housed in a rugged IP21 rated, galvanized steel Enclosure, the Xantrex GT250 E incorporates sophisticated Intellimod® (IPM) Insulated Gate Bipolar Transistors (IGBTs) as the main power switching devices. An advanced, field-proven, Maximum Peak Power Tracker (MPPT) integrated within the Xantrex GT250 E control firmware ensures the optimum power throughput for harvesting energy from the photovoltaic array.

The advanced design of the Xantrex GT250 E includes an EMI output filter and the main AC contactor located electrically on the inverter side of the isolation transformer.

Additionally, the Xantrex GT250 E integrated controller contains self-protection features including over and under voltage and frequency safeguards. An integral anti-island protection scheme prevents the inverter from feeding power to the grid in the event of a utility outage. The Xantrex GT250 E includes a local user interface comprised of an ON/OFF switch, keypad, and 4-line, 80 character LCD display. A user-friendly, Graphic User Interface (GUI) provides a remote interface for operator interrogation of Xantrex GT250 E system status, control, metering/ data logging and protective functions within the Xantrex GT250 E. The status, control, and logging features are also supported by the data modem (included) and can be accessed remotely.

The Xantrex GT250 E comes in a set of three Enclosures to house the Electronics described above. The left section is the AC Interface Enclosure (-H0). The center section is the Main Inverter Enclosure (-H1). The right section is the DC Interface Enclosure (-H2). The three Enclosures are constructed and delivered as one complete assembly. These components are identified in Figure 1-1 on page 1–3 and the dimensions are identified in Figure A-1 on page A–6.

Operator Interface Controls

The Xantrex GT250 E comes in a set of 3 enclosures to house the Electronics described above. The left section is the AC Interface Enclosure (-H0). The center section is the Inverter Enclosure (-H1). The right section is the DC Interface Enclosure (-H2). The 3 enclosures are constructed and delivered as one complete assembly.

Operator interface controls are located on the front door of the main inverter Enclosure. These controls include an ON/OFF Switch, 4-line LCD display and keypad called the Universal Frontpanel Control Unit (UFCU). Additionally there is an AC and DC Disconnect on the AC Interface Enclosure and the DC Interface Enclosure Doors and an Emergency (E-STOP) push button.

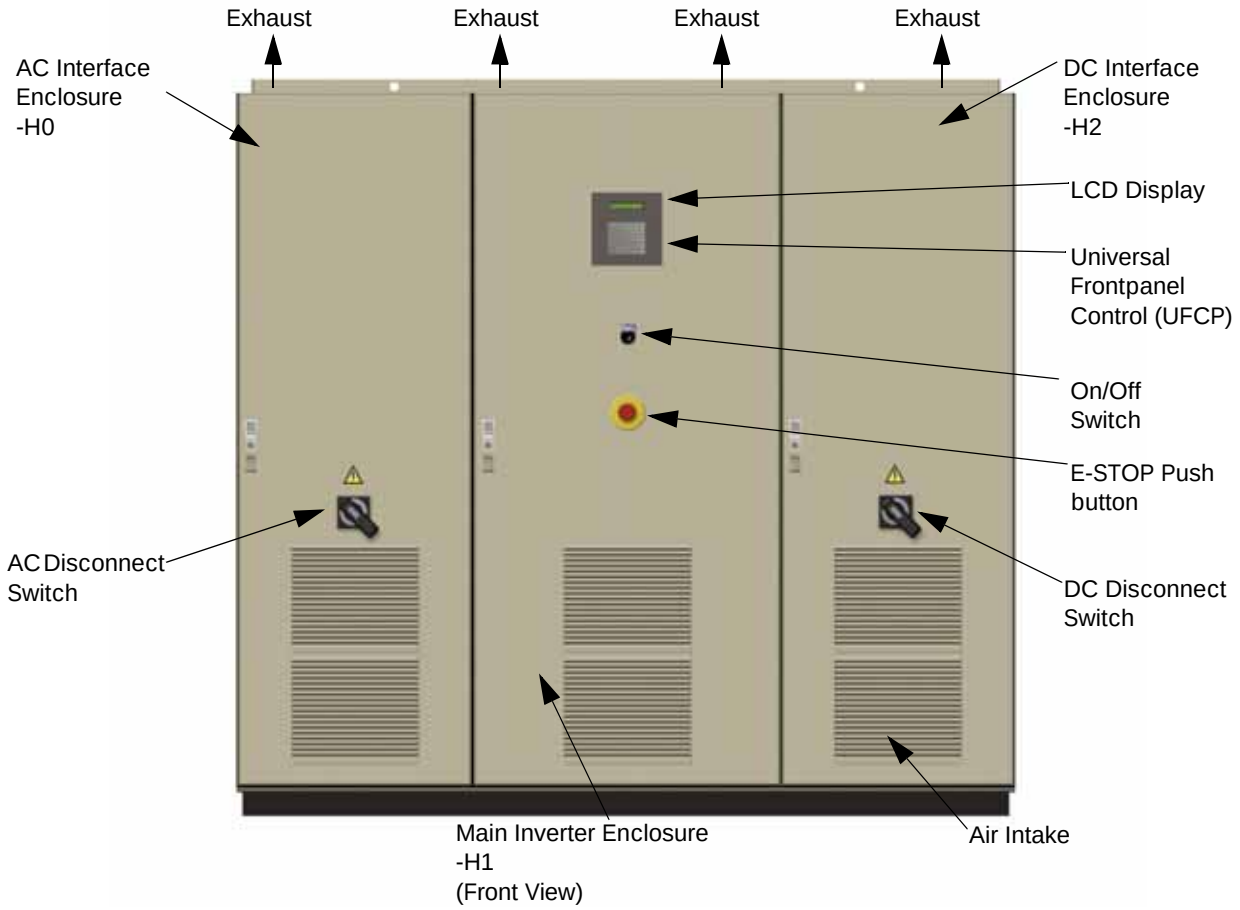

Figure 1-1 Xantrex GT250 E Operator Interface Components

WARNING: Shock Hazard

Before attempting to service the Xantrex GT250 E, follow the de-energize Lockout and Tag procedure in the Xantrex GT250 E Operation and Maintenance Manual.

This manual is for use by qualified personnel only.

ON/OFF Switch

The Xantrex GT250 E incorporates a maintained position ON/OFF switch located on the right center door, under the main control display. Under normal conditions, the ON/OFF switch is in the ON position. Turning the switch to the OFF position will initiate an immediate controlled shutdown of the Xantrex GT250 E and open both the main AC and DC contactors within the unit. The main AC and DC contactors cannot be closed unless the switch is in the ON position. The Xantrex GT250 E is prevented from being restarted until the ON/OFF switch is turned back to the ON position.

WARNING: Shock Hazard

Turning the ON/OFF switch to the OFF position does NOT remove all hazardous voltages from inside the inverter. Before attempting to service the Xantrex GT250 E, follow the de-energize Lockout and Tag procedure page ix.

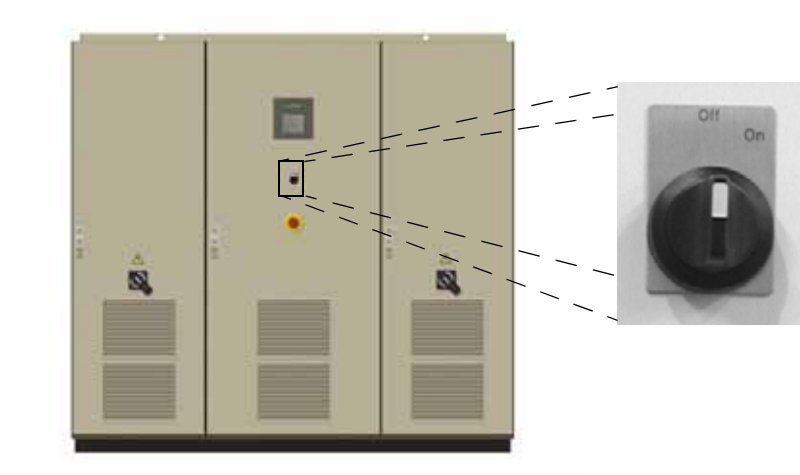

Figure 1-2 ON/OFF Switch

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Emergency Stop (E-STOP)

The Xantrex GT250 E incorporates a maintained position E-STOP pushbutton located on the Inverter Enclosure. Under normal conditions, the E-STOP pushbutton is in the CLOSED (extended) position. Pushing the pushbutton to the OPEN (depressed) position will initiate an immediate controlled shutdown of the Xantrex GT250 E and open both the main AC and DC contactors within the unit. The main AC and DC contactors cannot be closed unless the pushbutton is in the CLOSED (extended) position. The Xantrex GT250 E is prevented from being restarted until the E-STOP pushbutton is in the CLOSED (extended) position.

Provisions are supplied for adding a remote emergency stop circuit.

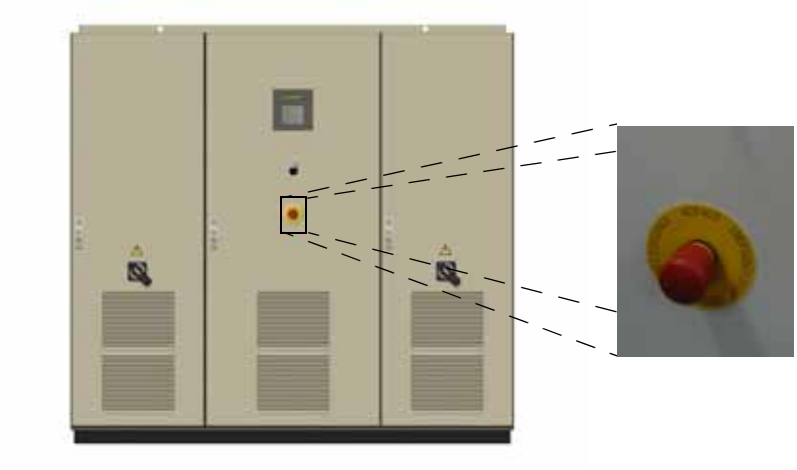

Figure 1-3 Emergency Stop

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AC and DC Disconnect Switches

Both AC and DC Interface Enclosure doors are equipped with lockout hasps for personnel safety. The Enclosure doors should not be opened while the Xantrex GT250 E is operating.

The switch handles and shafts provide a door interlock for both the AC and DC interface Enclosures. The doors cannot be opened when the switch is in the ON position.

The AC and DC Disconnect switches are each equipped with an auxiliary contact block which enables the switch to be used as a load break disconnect. In the event that either Disconnect switch is opened while the Xantrex GT250 E is processing power from the PV array, the early-break contact block will signal the CCU2 (Converter Control Unit) to stop processing power prior to opening the Disconnect switch.

Additionally, opening the Disconnect switch will cause the Xantrex GT250 E to execute an immediate orderly shutdown, open both the main AC and DC contactors, and report a E-STOP fault on the LCD of the UFCU.

When working on the system, disconnecting only the main control switch on the AC and DC side is insufficient.

All Xantrex GT250 E Inverter Enclosure doors must be locked during normal operation.

WARNING: Shock Hazard

Disengaging the Inverter Enclosure door interlock switch does NOT remove all hazardous voltages from inside the inverter. Before attempting to service the Xantrex GT250 E, follow the de-energize Lockout and Tag procedure on page ix.

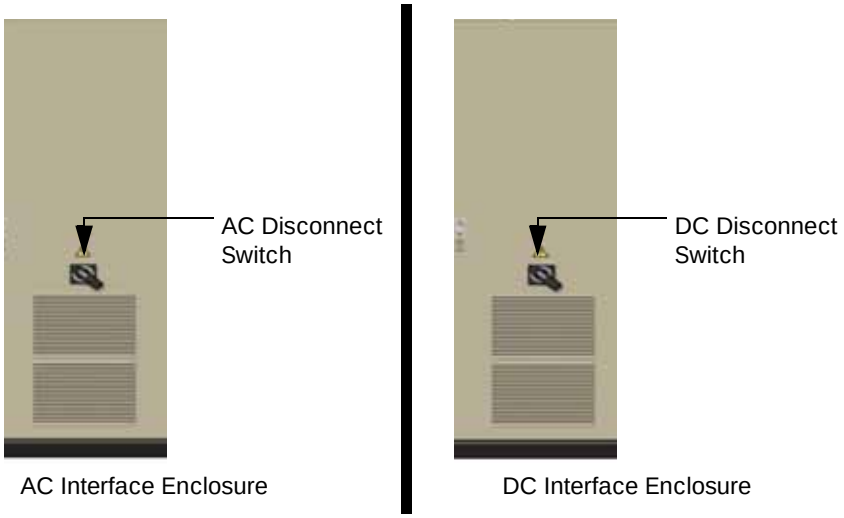

Figure 1-4 AC and DC Disconnect Switches

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Communication Features and Methods

The Xantrex GT250 E provides two types of information to the user:

- system status and/or fault information, and
- data logging information.

System status and fault information can be accessed using the Universal Front Panel Control Unit (UFCU) or a personal computer using the Xantrex Solar Graphic User Interface (GUI) software. Data logging requires the use of a PC using the GUI software.

The Xantrex GT250 E communicates system status information to the user using the following methods.

- The Front Panel Control Unit (UFCU) Display
- PC Connection (Direct and/or Remote) - Xantrex Solar Graphic User Interface (GUI) Software required (may require additional hardware)
- External Analog Monitoring - (Optional) (e.g., Irradiance, PV temp, ambient temp, wind speed) (requires additional hardware)

System Status and Fault Reporting

Basic system status and all fault conditions rising from within the Xantrex GT250 E are reported to the UFCU. The unit stores the time and details of all faults in non-volatile memory. The 4-line LCD will display a hexadecimal value and a brief text description of the fault.

The fault value is also made available to the Graphic User Interface (GUI). The GUI has a more extensive description of the fault.

The UFCU keypad is located on the right center door to manipulate and view system operation and status. The keypad is comprised of 20 touch-sensitive keys that provide a means to navigate through the menus and alter user-changeable settings.

See the Xantrex GT250 E 250 kW Grid-Tied Photovoltaic Inverter Operation and Maintenance Manual (Part #: 152937) for details.

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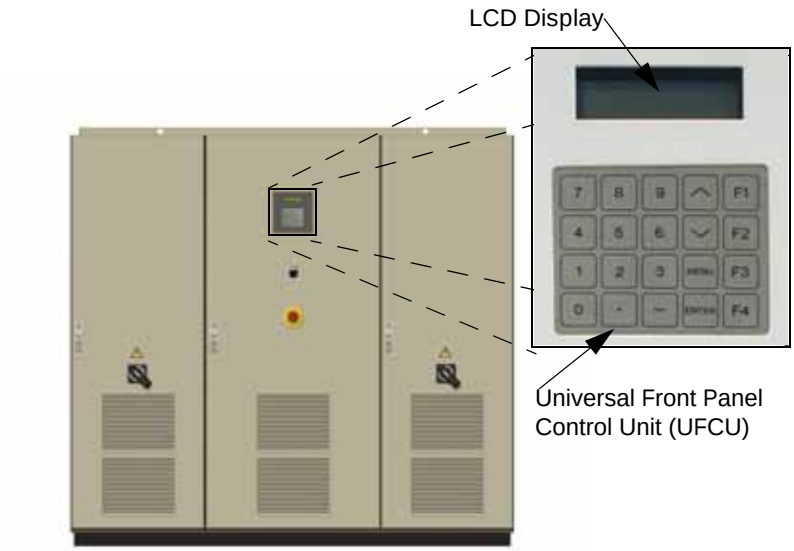

Figure 1-5 LCD Display and UFCU Location

This information can also be accessed using a personal computer using the GUI software either directly or remotely. Alternatively, the fault reporting can be accomplished using the optional Fax Modem.

Types of status information include:

- Current Operating State or Goal State
- Fault Code (if applicable)
- Inverter State
- Line Voltage and Current
- Inverter Matrix Temperature
- Inverter Power
- PV State
- PV Voltage and Current
- PV Power
- Grid Frequency
- Peak Power Tracker Enabled

Data Logging

The inverter stores data values and software metrics for debugging. These values are stored within the CCU2 controller board in non-volatile memory. Data logging requires the use of a PC connection using the Xantrex Solar Graphic User Interface (GUI) software.

- The Data Logging features include:
- Operational Values
- Internal Metrics
- Data Log Acquisition
- Graphic Data Analysis
- Fault Log Acquisition
- Software Upgrade
- Accumulated Values
- Configurable Parameters

PC Connection Methods

Personal computers can be used to access the system status and programming features of the Xantrex GT250 E. This allows monitoring and control of the inverter from a remote office, a home office, motel room, or any location where a laptop or desktop computer can make a modem telephone call. Computers can be connected either directly or remotely. Software is included to provide a graphic user interface that relates important system information. This software is called Xantrex Solar Graphic Interface (GUI). See "Computer Communications with the Xantrex GT250 E" in the Xantrex GT250 E 250 kW Grid-Tied Photovoltaic Inverter Operation and Maintenance Manual (Part #: 152937) for additional information.

The Enclosure comes with a factory-installed MultiTech® 56K modem and Surge Arrestor (-F36). The RS232/Fiber optic converter is configured for ethernet use. If you are planning on using this connection for direct PC access, it will be necessary to replace the RS232/FO converter (Part #: 1-152059-03) with RS232/FO converter (Manufacturer p/n: 1-152624-01 KIT, COMM, DIRECT, PC TO CCU).

The GUI can dial up the inverter and receive fault report calls from it through a standard Hayes-compatible, landline modem. When the GUI initiates a call through the modem at the GUI computer, the inverter's modem answers the call and initiates a 9600 baud serial connection, effectively as if the GUI was connected directly. Or, if the inverter experiences a fault, it will initiate a call to the GUI and report the fault details.

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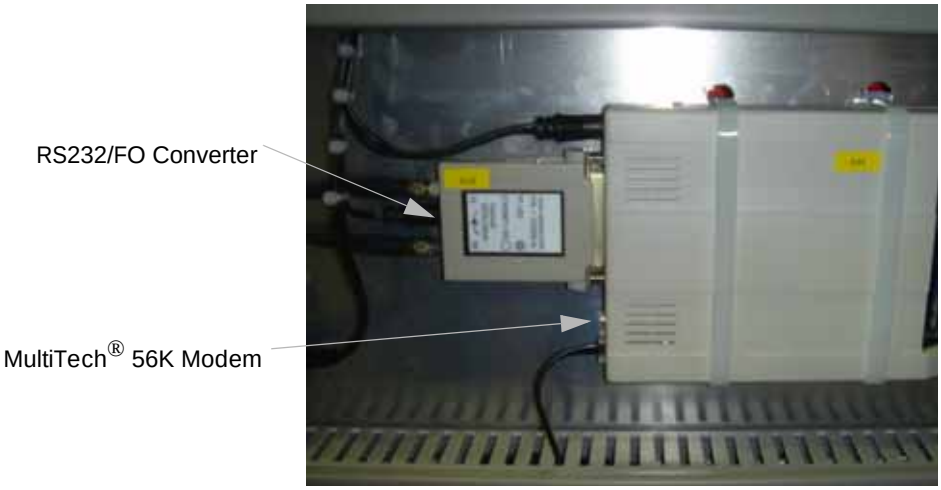

Figure 1-6 MultiTech® 56K Modem and RS232/FO Converter

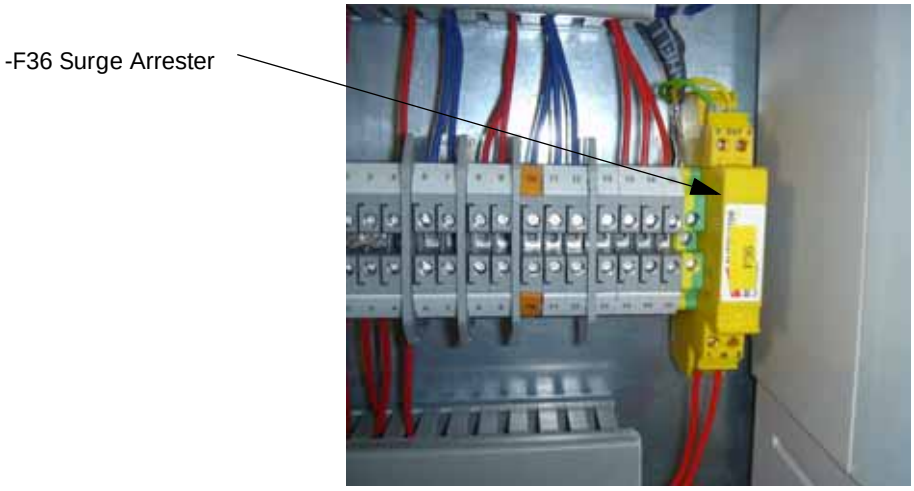

Figure 1-7 Surge Arrester

Direct Access Connection

The Xantrex GT250 E can be directly accessed by a computer. This connection requires using the RS232 Converter kit (Manufacturer p/n: 1-152624-01 KIT, COMM, DIRECT, PC TO CCU). The kit contains an RS232/FO converter configured for PC use with an adapter, a DB9/DB25 serial cable and a fiber optic harness.

Remote Access Connection

The Xantrex GT250 E can be remotely accessed through a telephone connection. A MultiTech® 56 Kbps data modem is installed in the inverter for connection to a remote computer. The customer has the ability to control and monitor the status of the inverter through this connection.

Optional Equipment

The following options are available for purchase for use with the Xantrex GT250 E to enhance its communications capability. The additional Xantrex GT250 E options can be field installed. Contact a Schneider Electric distributor for further information on installation options.

RS232 Converter Kit

RS232 Converter kit (Manufacturer p/n: 1-152624-01 KIT, COMM, DIRECT, PC TO CCU) contains an RS232/FO converter configured for PC use with an adapter, a DB9/DB25 serial cable and a fiber optic harness (not shown).

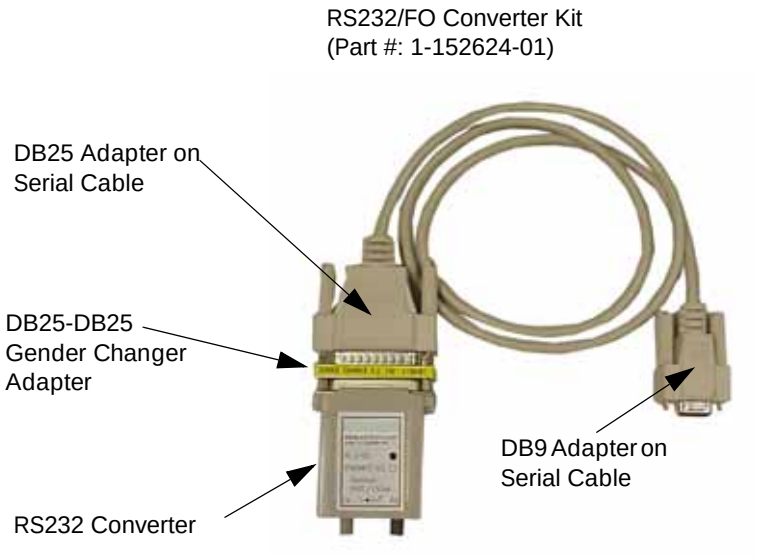

Figure 1-8 RS232/FO Converter Kit

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2 Planning

Chapter 2, “Planning” provides information to help plan the installation of the Xantrex GT250 E 250 kW Grid-Tied Photovoltaic Inverter.

Overview of Xantrex GT250 E Installation

WARNING: Shock Hazard

Installations of this equipment should only be performed by qualified technicians. Installers must meet all local and state code requirements for licensing and training for the installation of Electrical Power Systems with AC and DC voltage to 600 volts.

Planning Planning for a system requires complete understanding of all the components that are involved to successfully install the Xantrex GT250 E to meet the required national, state, and local codes.

Definition A power system (such as the Xantrex GT250 E) is a collection of devices designed to supply AC power to the utility grid from a solar energy (PV) source.

Components All types of grid-tied inverter installations, residential or industrial, share common components. This chapter describes each component and suggests the minimum requirements for a safe installation.

Location The Xantrex GT250 E 250 kW Grid-Tied Photovoltaic Inverter is designed to be installed in an indoor location. The Xantrex GT250 E must be anchored to a level, concrete floor or pad.

Clearance Adequate ventilation and service access must be taken into consideration when installing the Xantrex GT250 E. See “Environmental Requirements” for specific clearance requirements and ambient temperature requirements.

PV Planning

To determine the number of photovoltaic panels that are required for the PV power plant, please use the PV planning tool from the Schneider Electric website:

1. Go to www.schneider-electric.com.
2. Open the Products and Services tab and click Renewable Energies.
3. Navigate to your specific product page.
4. Click Sizing Tools.

Environmental Requirements

The following environmental conditions must be established and maintained to ensure the safe and efficient operation and servicing of the Xantrex GT250 E.

- Maintain a minimum clearance of 60 cm plus local safety requirements in front of the enclosure for air intake, maintenance and serviceability.
- External cabling enters the Xantrex GT250 E from the bottom. Either the Xantrex GT250 E needs to be placed over a foundation hole which holds the cables, or placed on top of a hollow platform which allows access to the bottom of the Xantrex GT250 E.
- If external air is used for ventilation, the required liter per minute (L/M) rate must be no less than 87,000 L/M. This assumes the temperature inside the building is allowed to rise 10 °C (18 °F) above the outside temperature. Therefore, the maximum allowable outside ambient temperature is 50 °C (50 °C minus 10 °C equals 40 °C Maximum Ambient Temperature) or 122 °F (122 °F minus 18 °F equals 104 °F Maximum Ambient Temperature).
  If air conditioning is planned the heat load of the Xantrex GT250 E is 60,000 BTU/Hour at full load.

Ground Requirements

This product is intended to be installed as part of a permanently grounded electrical system per National Electric Code ANSI/NFPA 70 and EU requirements as well as all state and local code requirements (for example DIN/VDE). A copper ground rod must be installed within 3 ft. (1 m) of the Xantrex GT250 E Enclosure. This is the single point earth ground for the inverter system. The single point ground for the system is to be made at the AC ground bus bar (PE) in the AC Interface Enclosure.

Communication Requirements

The Xantrex GT250 E comes equipped with a MultiTech® 56K modem to provide remote access to the unit. A direct analog phone line to the local phone service is required to use this feature.

The phone line used for Xantrex GT250 E communication cannot be routed through a Private Branch Exchange (PBX) unless an analog PBX card is used.

Determine which communications options are required for the installation and procure the appropriate equipment and phone access.

Utility Side Isolation Transformer Requirements

The Xantrex GT250 E may be supplied with a custom, high-efficiency, isolation transformer as a separate component. The utility side windings of the isolation transformer are configured Wye and must match the voltage at the utility inter-tie. The Xantrex GT250 E is a balanced, three-phase, current-sourcing inverter and only operates with the presence of a stable utility voltage. The transformer is also supplied with a neutral connection on the utility interconnect. Connection of this utility-side neutral does not affect the operation of the inverter, however connection of the neutral on the inverter-side does affect the operation and must be left floating or disconnected. Single-phase, grounded loads which may be present between the transformer and utility, will maintain their existing ground reference at the utility distribution transformer.

WARNING: Lethal Voltage

Grounding the neutral of a Wye-wound transformer may create an “open delta” condition, depending on the utility configuration. This condition may keep the Xantrex GT250 E from detecting a loss of phase condition on the utility system, which may allow potentially lethal voltage to be present on the open-phase wiring.

CAUTION: Equipment Damage

If the Isolation Transformer neutral terminal is tied to ground, it will cause irreparable damage to the Xantrex GT250 E. Check local regulations for their requirements regarding the connection of these neutrals.

Electrical Diagrams

Since installations vary widely, a sample electrical diagram of the Xantrex GT250 E is provided in Figure 2-1. This diagram is to be used for system planning purposes only.

For more detailed information, refer to the schematic illustrations inside the door of the enclosure for electrical schematics.

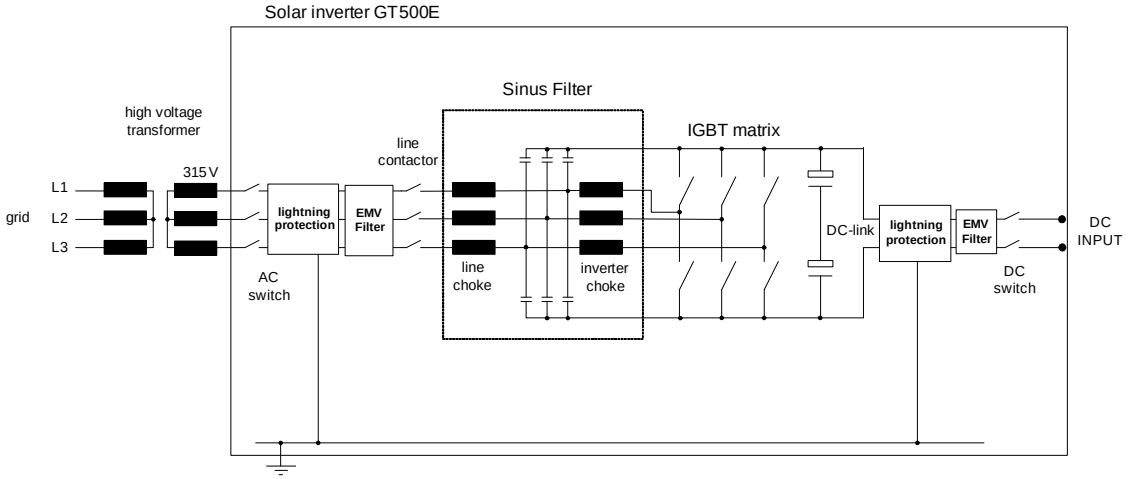

Figure 2-1 Xantrex GT250 E Electrical Diagram

Conduit Entry

Figure 2-2 shows the maximum allowable area and location in which electrical conduits may penetrate the Enclosures of the Xantrex GT250 E.

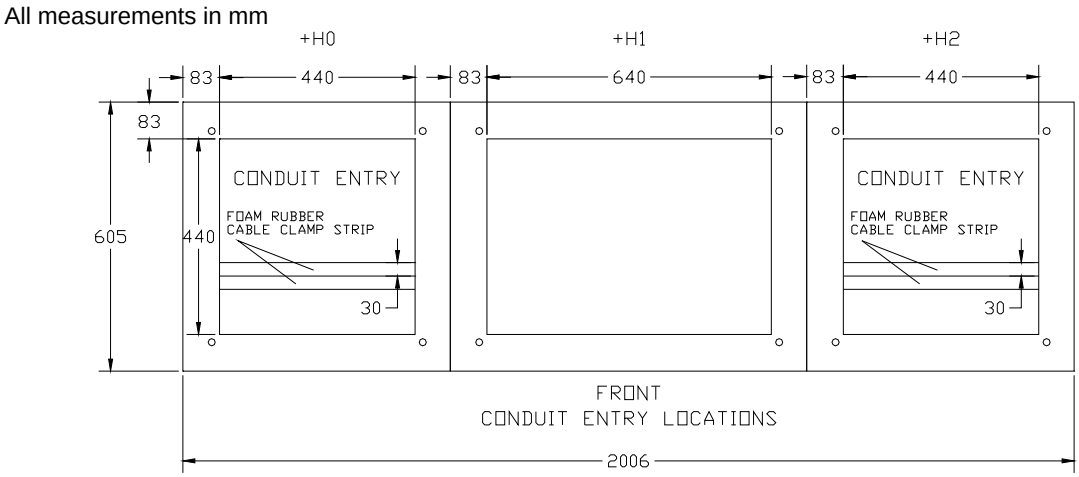

Figure 2-2 Enclosure Conduit Entries, Bottom Side View

This manual is for use by qualified personnel only.

Anchoring the Xantrex GT250 E

The Xantrex GT250 E is designed to be installed in an indoor location. It must be placed on and anchored to a level concrete floor or pad. The concrete floor or pad, upon which the Xantrex GT250 E is anchored, must be structurally designed to meet any local, state, or national requirements for weight, seismic, and wind sheer if applicable.

Twelve 16 mm holes are provided in the feet of the Enclosure for anchoring to the floor or pad.

Figure 2-3 depicts the layout pattern of the anchoring holes for the Xantrex GT250 E inverter assembly.

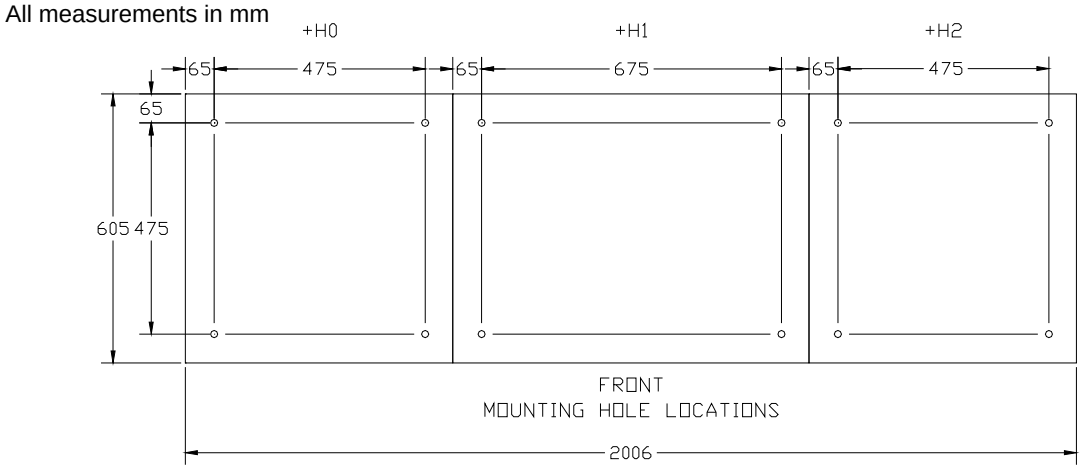

Figure 2-3 Main Inverter Anchor Bolt Pattern (Not to scale)

The floor or pad should either be pre-drilled to accept masonry anchors or have pre-installed anchoring bolts.

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3 Installation

Chapter 3, “Installation” describes the procedures needed to install the Xantrex GT250 E 250 kW Grid-Tied Photovoltaic Inverter. This section includes unpacking and moving instructions, mounting instructions, and cabling instructions.

Unloading

WARNING: Heavy Equipment

The Xantrex GT250 E weighs approximately 1160 kg. Attempting to lift the equipment by other than the recommended lifting points may damage the equipment or present a personnel safety hazard and void the warranty. Keep all the doors closed and latched when moving the Enclosures. Leaving the door latches unsecured may result in damage to the unit and void the warranty.

Moving the Xantrex GT250 E

To move the Xantrex GT250 E, use a forklift that has a sufficient lift capacity and has a 66 cm fork span or a crane with a minimum lift capacity of 2000 kg.

WARNING: Equipment is heavy

If lifted incorrectly, the Xantrex GT250 E could overbalance and cause personal injury.

Follow Figure 3-2 and Figure 3-3 to locate the balance point (center of gravity symbol) of various configurations.

CAUTION: Equipment Damage

To move the Xantrex GT250 E, use a forklift that has a sufficient lift capacity and has a 66 cm fork span.

To move the Xantrex GT250 E by forklift while it is still inside the shipping crates:

1. Place the forks of the forklift below the shipping crate at the points specified on the shipping crate.
2. Pay attention to the balance point (center of gravity) sticker.
3. Lift the Enclosure from beneath the shipping crate.

Unpacking the Xantrex GT250 E

To unpack the Xantrex GT250 E from the shipping crate:

1. Using a claw hammer or pry bar, remove the crate's wood top and side panels.
2. Remove the Xantrex GT250 E anchor hardware that attaches it to the shipping pallet.

Removing the Pallet and Moving the Xantrex GT250 E

CAUTION: Equipment Damage

To move the Xantrex GT250 E, use a forklift that has a sufficient lift capacity and a 66 cm fork span.

Use Figure 3-1 to locate the balance point or center of gravity (symbol).

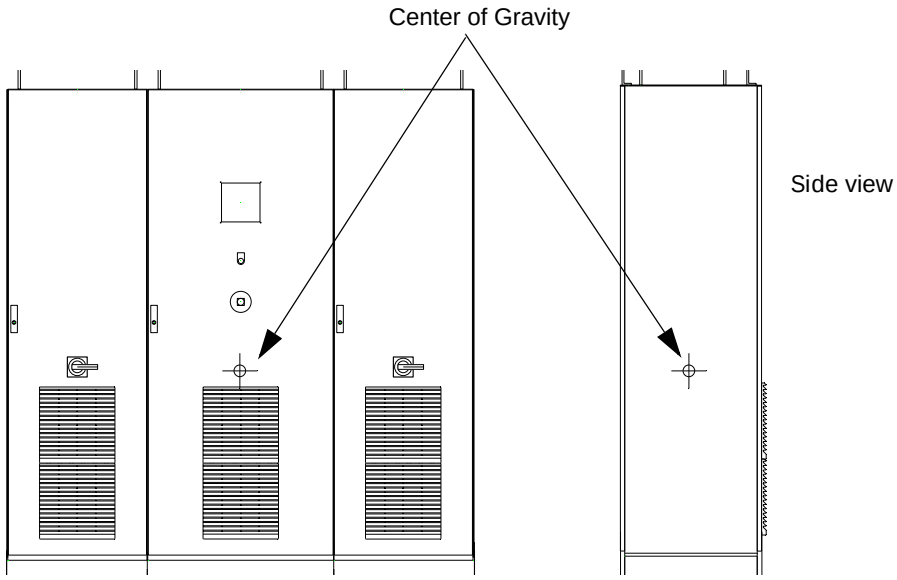

Figure 3-1 Center of Gravity

Moving with a Forklift

To move the Xantrex GT250 E using a forklift:

1. Place the forks of the forklift below the unit at the points specified in Figure 3-2.
2. Lift the Xantrex GT250 E from beneath the respective Enclosures. Be sure to use a forklift with a 66 cm fork span.
3. Remove the pallet from beneath the unit.
4. Once the pallets are removed from the units, use the same lifting locations to lift the units into the place where they are to be permanently located.

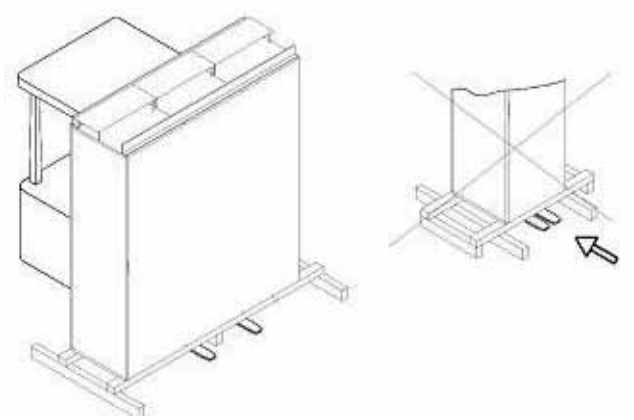

Figure 3-2 Forklift Lifting Locations - Underneath Unit

Moving with a Crane

Ensure you dismantle the top for transport.

To move the Xantrex GT250 E with a crane:

1. Attach the crane to the four anchor points on the track.
2. Pay attention to the balance point (center of gravity) sticker.
3. Lift the Enclosure into position.
4. Remove the tracks before operating the Xantrex GT250 E.

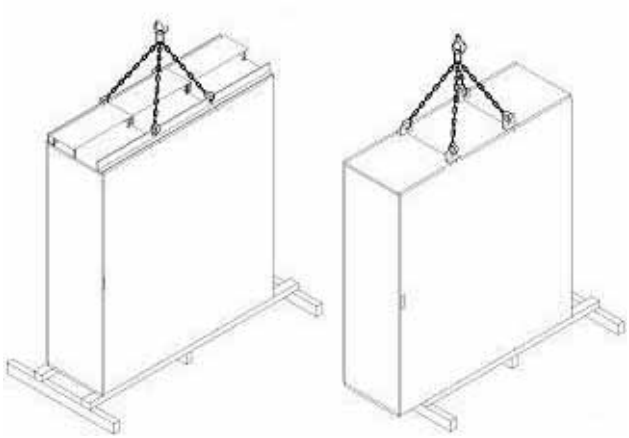

Figure 3-3 Lifting Using a Crane

Important: Before proceeding with the installation, determine the location and layout of the components, conduit penetration locations, conductor and conduit sizing, and method for anchoring the unit. Ensure adequate space is provided for clearance for ventilation and serviceability. Review Chapter 2, “Planning” if necessary before proceeding.

Mounting and Anchoring the Units

To mount and anchor the Xantrex GT250 E:

1. Predrill the floor or pad to accept masonry anchors for 12 mm bolts, or ensure it has pre-installed anchoring bolts that will fit the 16 mm mounting holes. See Figure 2-3 on page 2–6.
2. Lift the Xantrex GT250 E from beneath with a forklift or pallet jack as shown in Figure 3-2 on page 3–4, or lift the Xantrex GT250 E from above with a crane as shown in Figure 3-3 on page 3–4. Move the Enclosure into place.
3. Secure the Enclosure feet to the floor with the appropriate anchoring hardware.

Opening or Closing Access Doors

To lock or unlock the front door on the main inverter:

1. Use the key provided with the unit.
   a) Insert the key in the lock and turn clockwise to open or counterclockwise to lock.
   b) Pull the front door open from the center.

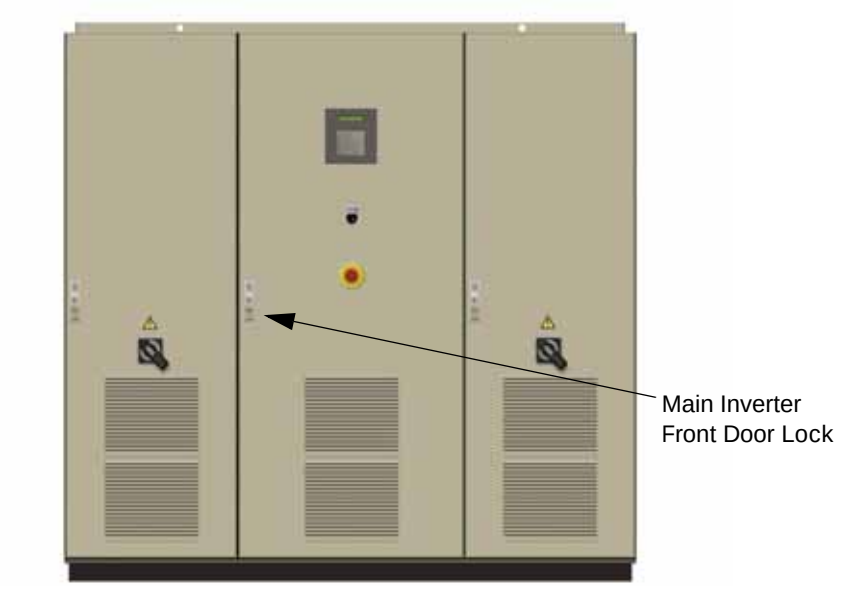

Figure 3-4 Inverter Enclosure Access Doors

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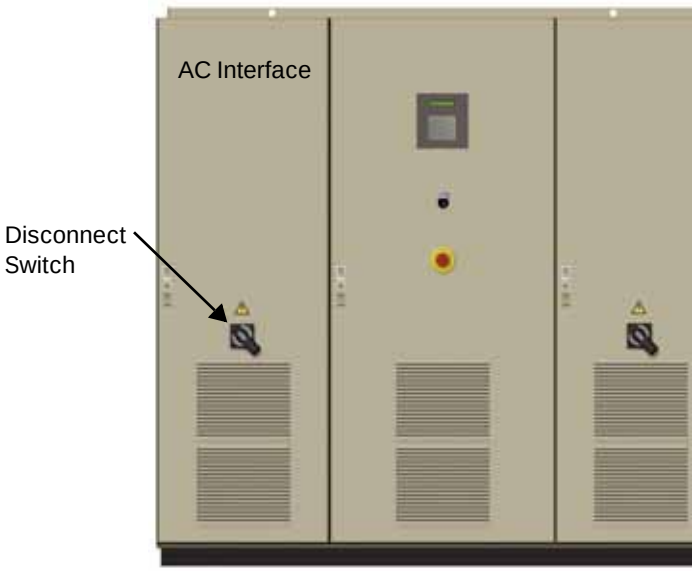

To Open Access Door:

1. Confirm that the AC Disconnect Switch handle is placed in the OFF (Open) position prior to opening the door.
2. Using the key supplied with the unit, turn clockwise to unlock.
3. Pull open from right side.

To Close Access Door:

1. Confirm that the AC Disconnect Switch handle is placed in the OFF (Open) position prior to closing the door.
2. Close the door.
3. Using the key supplied with the unit, turn counterclockwise to lock.

Figure 3-5 AC Interface Access Door

To Open Access Door:

1. Confirm that the DC Disconnect Switch handle is placed in the OFF (Open) position prior to opening the door.
2. Using the key supplied with the unit, turn clockwise to unlock.
3. Pull open from the left side.

To Close Access Door:

1. Confirm that the DC Disconnect Switch handle is placed in the OFF (Open) position prior to closing the door.
2. Close the door.
3. Using the key supplied with the unit, turn counterclockwise to lock.

Figure 3-6 DC Interface Access Door

This manual is for use by qualified personnel only.

Wiring - General

All wiring methods and materials shall be in accordance with the National Electrical Code ANSI/NFPA 70, European Requirements, as well as all state and local code requirements (for example, DIN / VDE). When sizing conductors and conduits interfacing to the Xantrex GT250 E, both shall be in accordance with the National Electric Code ANSI/NFPA 70, European Requirements, as well as all state and local code requirements (for example DIN / VDE).

WARNING: Shock Hazard

The Xantrex GT250 E Enclosures contain exposed high-voltage conductors. The Enclosure doors should remain closed with the latches tightened, except during installation, maintenance or testing. These servicing instructions are for use by qualified personnel who meet all local and state code requirements for licensing and training for the installation of Electrical Power Systems with AC and DC voltage to 880 volts. To reduce the risk of electric shock, do not perform any servicing other than that specified in the installation instructions unless you are qualified to do so. Do not open the cabinet doors if extreme moisture is present.

WARNING: Lethal Voltage

In order to remove all sources of voltage from the Xantrex GT250 E, the incoming power must be de-energized at the source. This may be done at the main utility circuit breaker and by opening the AC Disconnect and the DC Disconnect Switches on the Xantrex GT250 E. Review the system configuration to determine all of the possible sources of energy. In addition, allow 20 minutes for the DC bus capacitors, located within the cabinet, to discharge after removing power.

CAUTION: Equipment Damage

When connecting external AC wires to the Xantrex GT250 E, positive phasing sequence must be maintained throughout the installation process. Refer to the system schematics in the unit enclosure for proper phasing convention.

Important: Take care to keep the wire bundles away from any sharp edges which may damage wire insulation over time. Consult the European Standards (for example, DIN/VDE) and NEC ANSI/NFPA 70 Code Book to ensure code compliance.

The model Xantrex GT250 E has a three-phase output.

Conductor size should have been pre-determined when the conduit was installed. Prepare the appropriate length conductors for each connection.

Overcurrent Protection

Unless provided as part of the Schneider Electric supplied equipment; the AC overcurrent protection for the Utility Interconnect (Grid-tie) must be provided by the installer as part of the Xantrex GT250 E installation.

CAUTION: Equipment Damage

In accordance with the NEC, ANSI/NFPA 70 (Ninth Edition) the following branch-circuit overcurrent protection must be provided:

- 1200A maximum

Conductor Termination

The Xantrex GT250 E has terminals and bus bars for making all wiring connections required for the installation. All terminals used for making AC and DC connections require the use of copper conductors with an insulation rating of 90 °C (194 °F) (or higher). For bolt size, and torque values for the AC terminals, see Table A-5 on page A–5. For bolt size, and torque values for the DC terminals, see Table A-6 on page A–5. All wiring methods and materials shall be in accordance with the National Electrical Code ANSI/NFPA 70, European Requirements, as well as all state and local code requirements (for example, DIN/VDE).

AC Interface Enclosure

The AC line terminals in the AC Interface Enclosure (L1, L2, and L3) have three bolts per pole and a maximum of two cables per bolt. These terminals require the use of crimp-on type ring-terminals or compression lugs.
See Figure 3-8 on page 3–9 for the location of these terminals.

The AC neutral terminal in the AC Interface Enclosure is one bolt per pole and and a maximum of two cables per bolt. These terminals require the use of crimp-on type ring terminals or compression-type lugs.
See Figure 3-9 on page 3–11 for the location of this terminal.

The AC Control Voltage Terminals are one wire per terminal (-X2-L1, -X2-L2, -X2-PE). These terminals require a crimp-on ferrule properly sized for the wire.
See Figure 3-10 on page 3–11 for the location of these terminals.

DC Interface Enclosure

The DC terminals in the DC Interface Enclosure (PV+ and PV-) have four bolts per pole and a maximum of two cable per bolt. These terminals require the use of crimp-on type ring-terminals or compression lugs.
See Figure 3-11 on page 3–12 for the location of these terminals.

Important: Keep these cables together as much as possible, and ensure that all cables pass through the same knockout and conduit fittings, thus allowing any inductive currents to cancel.

This manual is for use by qualified personnel only.

Grounding

System Grounding

Install a copper ground rod within 3 ft. (1 m) of the Xantrex GT250 E Enclosures per the National Electric Code ANSI/NFPA 70. The single-point ground for the system is to be made at the ground bar in the AC Interface Enclosure.

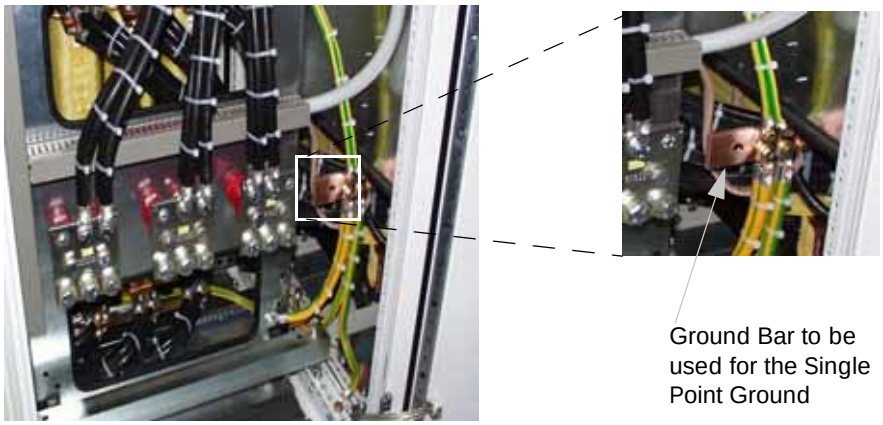

Figure 3-7 Single-point Ground; Ground Bar

Chassis Ground

The chassis ground is a copper bus bar in the Main Inverter Enclosure and has a 12 mm bolt for terminating the DC ground. The ground conductor size depends on the size of the main circuit breaker. NEC Table 250.122 (Ninth Edition) requires that the ground conductor be at least #3 AWG for a 400 A circuit breaker and #6 AWG for a 200 A circuit breaker.

The equipment ground on the Xantrex GT250 E is marked with PE.

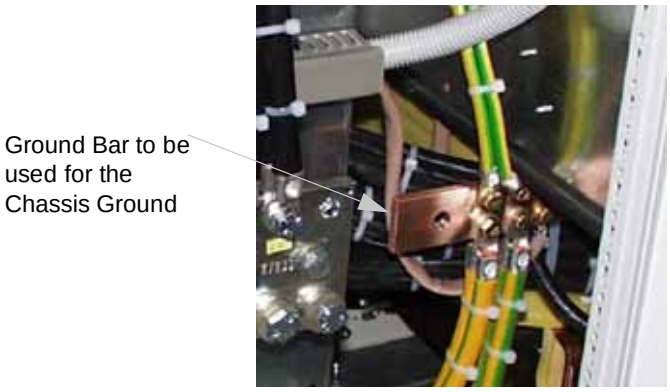

Figure 3-8 Chassis Ground Bar (TB1)

This manual is for use by qualified personnel only.

Wiring - Specific

This section provides information for connecting the AC and DC conductors and the ground conductors. Table A-5 and Table A-6 on page A–5 show the specifications of the AC and DC wiring.

To connect the transformer to AC Interface Enclosure:

1. Open the door to the AC Interface Enclosure.
2. Route the AC power conductors L1, L2, L3 phase, neutral, and a neutral ground cable through the conduit from the transformer to the AC Interface Enclosure.
3. Connect the AC power conductors at the L1 (A phase), L2 (B phase), and L3 (C phase) terminals using the M12 hardware. Cables to these terminals must use a crimp-on type ring terminal or compression-type lug. See Figure 3-9 for the location of these terminals.
4. Connect the neutral conductor at the Groundbar. Terminations for the neutral and ground conductors within the AC Interface Enclosure at the groundbar are made with 12 mm hardware. Cables to these terminals must use a crimp-on type ring terminal or compression-type lug. See Figure 3-8 for the location of these terminals.
5. Close the door to the AC Interface Enclosure.

To connect the AC Control Voltage to AC Interface Enclosure:

6. Open the door to the AC Interface Enclosure.
7. Route the AC Control voltage conductors –X2-L1, -X2-L2 and –X2-PE through the conduit from the source to the AC Interface Enclosure.
8. Connect the AC Control voltage conductors at the –X2 terminal block. These conductors must use crimp-on type Ferrule terminations and the M3 terminal hardware. See Figure 3-9 for the location of these terminals.
9. Close the door to the AC Interface Enclosure.

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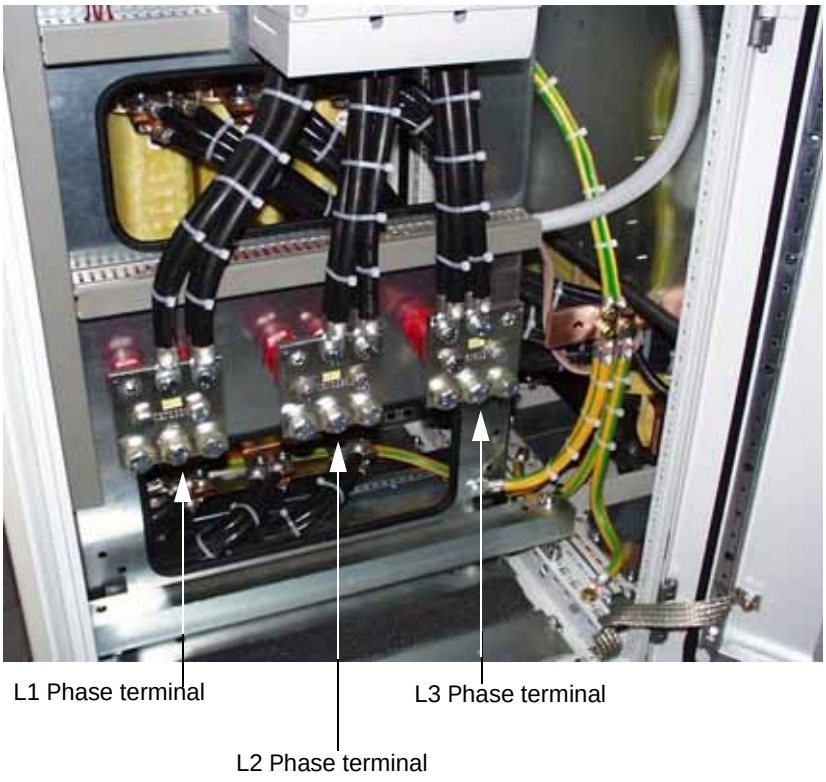

Figure 3-9 AC Terminal Connections from the Utility

Figure 3-10 AC Control Voltage Terminal Connections

This manual is for use by qualified personnel only.

PV Array Connections

To make the connections from the PV Array/combiner to DC Interface Enclosure:

1. Open the door to the DC Interface Enclosure.
2. Route the PV Array cables conductors POSitive (PV+) and NEGative (PV-) through the conduit to the DC Interface Enclosure, entering on the underside.
3. The DC power conductor terminations are made at the PV+, and PV- allocations and the ground bar. See Figure 3-11.
4. Terminations for the POSitive, NEGative, and PE (ground) conductors within the DC Interface Enclosure are made using the 12 mm hardware.
5. Close the door to the DC Interface Enclosure.

Figure 3-11 PV Array Cable Routing and Terminations

This manual is for use by qualified personnel only.

Remote Communications

The Xantrex GT250 E provides remote communications for system monitoring or data logging through a personal computer using the Xantrex Solar Graphic User Interface (GUI) software. The GUI software provides a windows-based interface program that accesses, monitors, and controls the features and functions of the unit. The GUI also provides additional data logging and tracking features which are not available through the UFCU. If multiple inverters are networked together, the software is capable of tracking up to 50 inverters on the same network.

The PC can be connected to the unit either directly or remotely. Before installing the GUI software, it will be necessary to determine and establish the proper communication line to support the desired connection.

A local telephone line is required to use the factory-installed modem.

Telephone Line Connections

To connect telephone service:

1. Unlatch and open the door to the AC interface enclosure.
2. Route the Telephone line through the wiring duct work.
3. Connect the Telephone to the RJ-11 termination. The RJ11 Termination is located to the right of -F36, see Figure 3-12.
4. Close and latch the door to the AC interface enclosure.

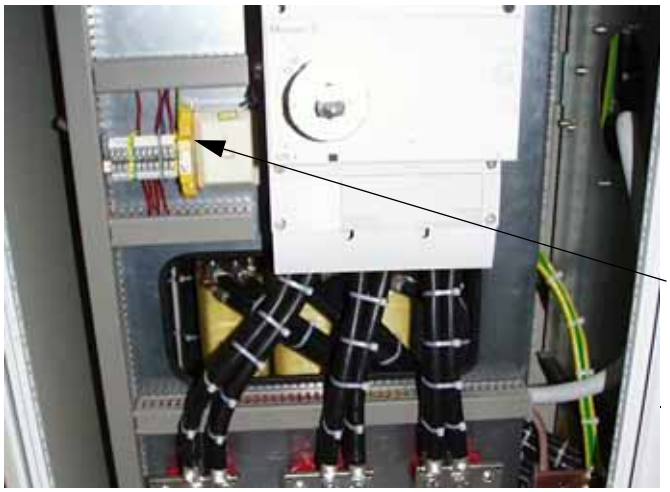

Figure 3-12 Telephone Cable Routing

This manual is for use by qualified personnel only.

PC Connection Methods

The personal computer can be connected the following ways.

- direct connection - to serial communication port on the controller board
- remote connection - through the modem installed in the Enclosure

Remote Connection (Standard)

The Xantrex GT250 E comes with a MultiTech™ 56K modem installed. This allows monitoring and control of the inverter from a remote office, a home office, motel room, or any location where a laptop or desktop computer can make a modem telephone call.

The GUI can dial up the inverter and receive fault report calls from it through a standard Hayes-compatible, landline modem. When the GUI initiates a call through the modem at the GUI computer, the inverter's modem answers the call and initiates a 9600 baud serial connection, effectively as if the GUI was connected directly. Or, if the inverter experiences a fault, it will initiate a call to the GUI and report the fault details.

If connecting to the Inverter remotely using the factory-installed modem:

1. Plug the local phone line into the port provided in the Inverter Enclosure following the instructions on page 3–13.
2. Install the GUI Software. See the Xantrex GT250 E 250 kW Grid-Tied Photovoltaic Inverter Operation and Maintenance Manual (Part #: 152937) for installation instructions.
3. Use a Terminal Emulation program on the PC to access the modem.

   See the GUI Help Menu "Communication by Modem" for instructions on setting up the Terminal Emulation program on the computer. See also, "Connect to Telephone Number" and "Connect to Remote Inverter by Modem" for additional information.

Direct Connection (Serial)

The direct connection provides the means to use the features of the GUI by connecting a PC directly to the CCU. This allows field personnel to monitor and control the inverter from a nearby laptop computer directly connected by a serial cable. The computer connects to the inverter directly through one of its serial COM ports running at 9600 baud.

The RS232/FO Converter kit (Manufacturer p/n: 1-152624-01 – KIT, COMM, DIRECT, PC TO CCU) is required for this connection to change the communication protocol from ethernet to serial in the Enclosure. The kit contains an RS232/FO converter configured for PC use with an adapter, a DB9/DB25 serial cable and a fiber optic harness.

If connecting the PC directly to the inverter:

1. Procure an RS232/FO Converter kit containing the converter, a DB9/DB25 serial cable and a fiber optic harness.
2. Record the color of the fibers connected to the white(TX) and Grey(RX) connectors of the Factory installed RS232/FO Converter and disconnect them from the Converter.
3. Remove the two covers from the fiber connectors on the new RS232/FO Converter and install them on the Factory installed converter.
4. Disconnect the power plug from the factory-installed converter and plug it in to the new RS232/FO Converter.
5. Using the fiber colors recorded in Step 2, connect the fibers to the new converter. Allow the Converter to hang from the fibers and the power cord.
6. Plug the DB25-to-DB25 Gender-changer Adapter into the Serial Communications Port on the RS232/FO Converter.
7. Plug the DB25 connector on the serial cable into the gender-adapter and the DB9 connector of the serial cable into the serial port on the computer. Route the cable such that it does not put additional strain on the fibers and power cord.

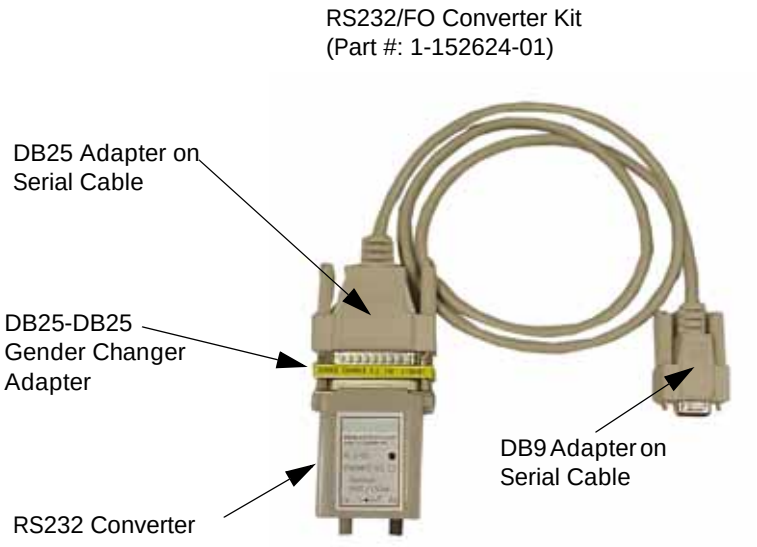

Figure 3-13 RS232/FO Converter Kit Installation

This manual is for use by qualified personnel only.

4 Verification

Chapter 4, “Verification” provides a checklist to ensure the installation of the Xantrex GT250 E is correct and complete.

Verification Procedure Summary

WARNING: Electrocution Hazard

This chapter describes specific steps to ensure the installation of the Xantrex GT250 E 250 kW Grid-Tied Photovoltaic Inverter is correct and complete. Failure to adhere to these warnings could result in severe shock or possible death. Exercise extreme caution at all times to prevent accidents. These installation instructions are for use by those familiar and skilled with high voltage procedures.

WARNING: Shock Hazard

The Xantrex GT250 E Enclosures contain exposed high-voltage conductors. The Enclosure doors should remain closed with the latches tightened, except during installation, maintenance or testing. To reduce the risk of electric shock, do not perform any servicing other than that specified in the installation instructions unless you are qualified to do so.

WARNING: Lethal Voltage

In order to remove all sources of voltage from the Xantrex GT250 E, the incoming power must be de-energized at the source. This may be done at the utility main circuit breaker and by opening the AC disconnect and the DC disconnect switches on the Xantrex GT250 E. Review the system configuration to determine all of the possible sources of energy. In addition, allow 20 minutes for the DC bus capacitors, located within the cabinet, to discharge after removing power.

The following procedures are intended to verify correct installation and proper wiring of the Xantrex GT250 E. Prior to performing the following verification steps on the Xantrex GT250 E, review all safety requirements and procedures outlined in this manual and on any cautionary markings on the components within the system.

Inspect the following items prior to completion of the installation:

1. Visually inspect all the mechanical connections. This would include both electrical conduit fittings, as well as Enclosure anchoring and seismic bracing if required.
2. Visually inspect the electrical connections and verify proper tightness of all terminations.
3. Visually inspect the Isolation Transformer Wye/Wye connections and ensure the transformer neutral connection is left disconnected or floating.
4. Perform corrective actions if required.

Visual Inspection of Mechanical Connections

To perform a visual inspection of the Xantrex GT250 E mechanical connections:

1. Ensure that the AC and DC Disconnect Switches, as well as any utility interconnect circuit breakers or main disconnect switches, are opened. ❒
2. Ensure all anchor bolts and any required seismic bracing is properly tightened and in place. ❒
3. Remove the latches and open the doors of the Inverter Enclosure, the AC and DC Interface Enclosures and inspect. ❒
4. Verify all wire conduit fittings and connections are properly tightened. ❒

Visual Inspection of Electrical Connections

To perform a visual inspection of the Xantrex GT250 E electrical connections:

1. Ensure that the AC and DC disconnect switches, as well as any utility interconnect circuit breakers or main disconnect switches, are opened. ❒
2. Ensure all conductors and wiring connections interfacing with the Xantrex GT250 E are tightened to the correct torque value.
   For specific torque values, see Table A-5 on page A–5 and Table A-6 on page A–5. ❒
3. Verify the AC power conductors terminated at L1, L2, L3 within the AC Interface Enclosure are terminated correctly and properly sequenced. ❒
4. Verify DC power conductors terminated at PV+ and PV- within the DC Interface Enclosure are terminated correctly and properly polarized. ❒

Corrective Action

Perform after initial inspection (if required):

1. Correct any necessary repairs pertaining to the previous inspection steps.
2. Replace the latches and close the doors of the Inverter Enclosure, the AC and DC Interface Enclosures.
3. Ensure that the AC and DC Disconnect Switches, as well as any utility interconnect circuit breaker or main disconnect circuit breaker, are left open.

This manual is for use by qualified personnel only.

A Specifications

Appendix A provides the environmental and electrical specifications for the Xantrex GT250 E 250 kW Grid-Tied Photovoltaic Inverter.

System Specifications

The Xantrex GT250 E has been designed for photovoltaic power systems, which operate within the following specifications.

CAUTION: Equipment Damage

Operation of the Xantrex GT250 E in a manner other than specified in this manual may cause damage to the Xantrex GT250 E and other system components and will void the terms of the warranty.

Environmental Specifications

CAUTION

The Xantrex GT250 E will be destroyed if stored outside. Only store in dry areas.

Table A-1 Environmental Specifications

Specification	Value
Dimensions	2112 mm H x 2006 mm W x 605 mm D (83 in. H x 78 in. W x 24 in. D)
Weight	1160 kg (2557 lbs)
Allowable Ambient Temperature	
Operating Storage	-10 °C to 45 °C Maximum (14 °F to 113 °F) -25 °C to 55 °C Maximum (-13 °F to 131 °F)
Relative Humidity	EN60721 temperature 1K1 humidity 1K3
Elevation	1500 m
Storage Air Pressure	700 to 1060 mbar
Protection Class	IP21
Cooling Air Power Element	1800 m^3/h starting temperature 68 °C
Interior Cooling Air	2400 m^3/h starting temperature 40/45 °C
Clearance (ventilation and serviceability)	
Top	100 mm
Front	600 mm (door clearance) plus local safety standards

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Electrical Specifications

Table A-2 provides the AC and DC specifications for the Xantrex GT250 E.

Table A-2 Electrical Specifications

Specification	Value
Suggested Maximum PV Array Power	280 kWp
Nominal AC Input Voltage	315 Vac ± 5%
Maximum AC Output Current	460 A_{rms}
Nominal AC Input Frequency (+0.5 to -0.7 Hz acceptable range)	50 Hz
Rated Output Power	250.0 kW at nominal AC input voltage (315 V)
Peak Power Tracking Window	450 to 800 Vdc
Maximum Open Circuit Voltage	850 Vdc (880 Vdc optional)
Maximum DC Input Current	555 A
DC Input	450 to 850 Vdc
Line Power Factor	approximately 1 (above 20% rated power)
AC Current Distortion	< 3% THD at rated power
Switching Frequency	4.5 kHz
Efficiency without Transformer	700 Vdc 315 Vac 250 kW 96.8% control voltage supplied externally
External Control Voltage	230 V/400 V
External Control Voltage's max. Power Output	2000 W
Inverter's Couple Capacity Against Earth	approx. 15 µF

Regulatory Specifications

Table A-3 provides the regulatory specifications for the Xantrex GT250 E.

Table A-3 Regulatory Specifications

Standard	Regulation Met
General Standards	EN50178 VDEW CE
Emitted Interference	EN61000-6-4
Interference Resistance	EN61000-6-2

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Over Voltage, Under Voltage and Frequency Ranges

Table A-4 provides the over voltage, under voltage, over-frequency, and under-frequency detection limits for the Xantrex GT250 E. These detection limits have been factory tested and deemed to be in compliance with requirements for utility interaction.

Table A-4 Over/Under Voltage and Over/Under Frequency Ranges

Vac Condition (% of Nominal)	Voltage Range 50Hz[a]	Voltage Range 60Hz[a]	Trip Time
Low Range 87% < Vac < 103%	275 < Vac < 325	275 < Vac < 325	100 ms
Low Default 90% < Vac	283.5 < Vac	283.5 < Vac	100 ms
High Range 97% < Vac < 113%	305 ≤ Vac <355	305 ≤ Vac <355	100 ms
High Default 110% < Vac	346.5 < Vac	346.5 < Vac	100 ms
50 Hz Low Range -2.0 < f < 0.5	48.0 < f < 50.5		2 cycles
50 Hz Low Default -1.0 < f	49.0 < f		2 cycles
50 Hz High Range -0.5 < f < 2.0	49.5 < f < 52.0		2 cycles
50 Hz High Default 1.0 < f	51.0 < f		2 cycles
60 Hz Low Range -0.5 < f < 0.5		59.5 < f < 60.5	2 cycles
60 Hz Low Default -0.5 < f		59.5 < f	2 cycles
60 Hz High Range -0.5 < f < 0.5		59.5 < f < 60.5	2 cycles
60 Hz High Default -0.5 < f		60.5 < f	2 cycles

a.Adjustable, password protected

Bolt Sizing and Torque Requirements

Table A-5 provides acceptable bolt sizes, and torque values for AC terminal connections.

Table A-5 AC Terminal Bolt Size, and Torque Values

AC Terminal Connections	Max. # of Conductors per Terminal	Bolt (Hardware) Size	Torque Requirements
PE (Enclosure Ground)	2	1/M12	75 Nm (55 lb ft)
L1, L2, L3	6	3/M12	75 Nm (55 lb ft)
-X2-L1, -X2-L2, -X2-PE	1	M3	0.6 – 0.8 Nm (5.3 – 7 lb ft)

Table A-6 provides acceptable bolt sizes, and torque values to be connected to the Xantrex GT250 E DC terminal connections.

Table A-6 DC Terminal Bolt Size, and Torque Values

AC Terminal Connections	Max. # of Conductors per Terminal	Bolt (Hardware) Size	Torque Requirements
PV+, PV-	8	4/M12	75 Nm (55 lb ft)

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Dimensions

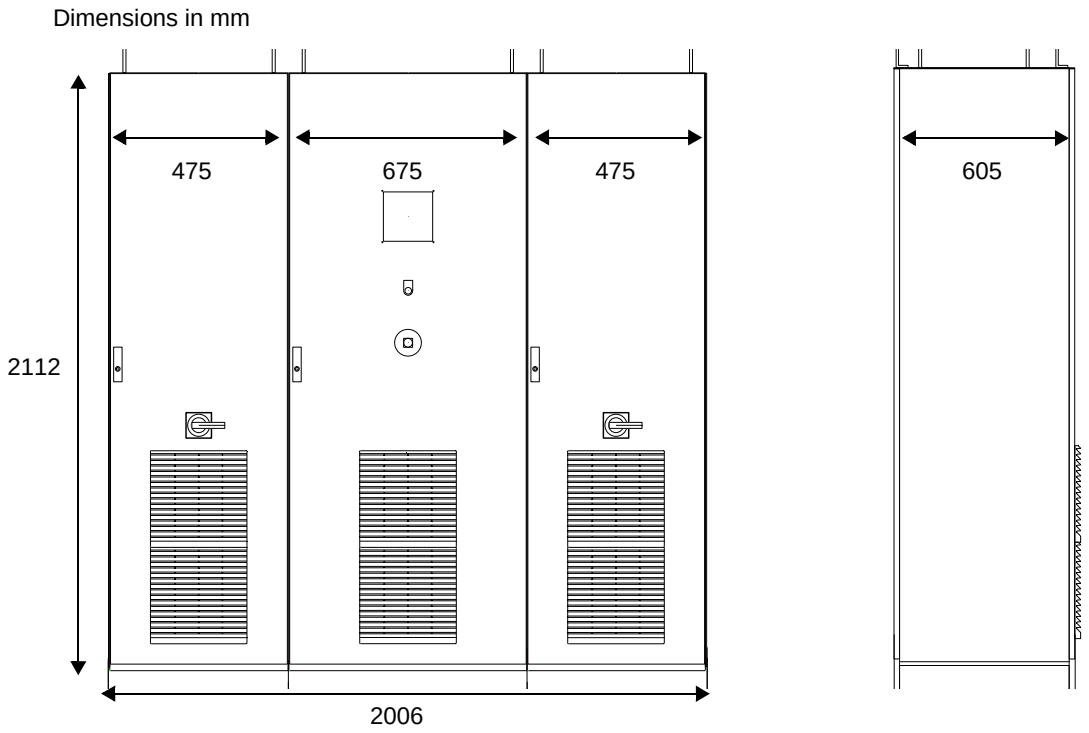

Figure A-1 Xantrex GT250 E Dimensions

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